

What is claimed is:

1. A substantially purified nucleic acid encoding a human Borna disease virus (BDV) p24 polypeptide comprising an amino acid residue sequence selected from the group consisting of SEQ ID NO 20, SEQ ID NO 21, SEQ ID NO 22, 5 MATGPSSLVDSLEDEEDP (SEQ ID NO 32) and RIYPQLPSAPTADEWDIIP (SEQ ID NO 33).

2. The nucleic acid according to claim 1 wherein the nucleic acid consists essentially of a nucleotide sequence of 10 SEQ ID NO 3.

3. The nucleic acid according to claim 1 wherein the nucleic acid consists essentially of a nucleotide sequence of SEQ ID NO 4.

4. The nucleic acid according to claim 1 wherein the 15 nucleic acid consists essentially of a nucleotide sequence of SEQ ID NO 5.

5. A substantially purified nucleic acid encoding a human Borna disease virus (BDV) p16 polypeptide comprising an amino acid residue sequence selected from the group 20 consisting of SEQ ID NO 23, SEQ ID NO 24, SEQ ID NO 25, MNSKHSYVELKGKVIVPG (SEQ ID NO 34) and RLRNIGVGPLGPDIRSSGP (SEQ ID NO 35).

6. The nucleic acid according to claim 5 wherein the nucleic acid consists essentially of a nucleotide sequence of 25 SEQ ID NO 7.

7. The nucleic acid according to claim 5 wherein the nucleic acid consists essentially of a nucleotide sequence of SEQ ID NO 8.

8. The nucleic acid according to claim 5 wherein the nucleic acid consists essentially of a nucleotide sequence of SEQ ID NO 9.

9. A substantially purified nucleic acid encoding a human Borna disease virus (BDV) p56 polypeptide comprising an amino acid residue sequence selected from the group consisting of SEQ ID NO 26, SEQ ID NO 27, GLSCNTDSTPGLIDLEIR (SEQ ID NO 36), RSKLRRRRRDTQQIEYLV (SEQ ID NO 37) and LISLCVSLPASFARRRRLGRWQE (SEQ ID NO 38).

10. The nucleic acid according to claim 9 wherein the nucleic acid consists essentially of a nucleotide sequence of SEQ ID NO 11.

11. The nucleic acid according to claim 9 wherein the nucleic acid consists essentially of a nucleotide sequence of SEQ ID NO 12.

12. A substantially purified nucleic acid encoding a human Borna disease virus (BDV) p40 polypeptide consisting essentially of an amino acid residue sequence selected from the group consisting of SEQ ID NO 28, SEQ ID NO 29, SEQ ID NO 30, MPPKRRLVDDADAMEDQD (SEQ ID NO 39), MEDQDDLYPEPPASLPKLP (SEQ ID NO 40) and ELSGEISAIMRMIGVTGLN (SEQ ID NO 41).

13. The nucleic acid according to claim 12 wherein the nucleic acid consists of a nucleotide sequence of SEQ ID NO 14.

14. The nucleic acid according to claim 12 wherein the nucleic acid consists of a nucleotide sequence of SEQ ID NO 15.

15. The nucleic acid according to claim 12 wherein the nucleic acid consists of a nucleotide sequence of SEQ ID NO 16.

5 16. A substantially purified nucleic acid encoding a human Borna disease virus (BDV) catalytic domain polypeptide of L polymerase protein consisting essentially of an amino acid residue sequence in SEQ ID NO 31.

10 17. The nucleic acid according to claim 16 wherein the nucleic acid consists of a nucleotide sequence of SEQ ID NO 18.

18. The nucleic acid according to claim 16 wherein the nucleic acid consists of a nucleotide sequence of SEQ ID NO 19.

19. A vector containing a nucleic acid of claim 1.

15 20. The vector according to claim 19 wherein the vector is an expression vector and the nucleic acid is operably linked to a promoter.

20 21. The vector according to claim 20 wherein the nucleic acid consists of a nucleotide sequence of claims 2, 3 or 4.

22. A vector containing a nucleic acid of claim 5.

23. The vector according to claim 22 wherein the vector is an expression vector and the nucleic acid is operably linked to a promoter.

25 24. The vector according to claim 23 wherein the nucleic acid consists of a nucleotide sequence of claims 6, 7 or 8.

25. A vector containing a nucleic acid of claim 9.

26. The vector according to claim 25 wherein the vector is an expression vector and the nucleic acid is operably linked to a promoter.

27. The vector according to claim 26 wherein the
5 nucleic acid consists of a nucleotide sequence of claims 10 or 11.

28. A vector containing a nucleic acid of claim 12.

29. The vector according to claim 28 wherein the vector is an expression vector and the nucleic acid is operably
10 linked to a promoter.

30. The vector according to claim 29 wherein the nucleic acid consists of a nucleotide sequence of claims 13, 14 or 15.

31. A vector containing a nucleic acid of claim 16.

15 32. The vector according to claim 31 wherein the vector is an expression vector and the nucleic acid is operably linked to a promoter.

33. The vector according to claim 32 wherein the nucleic acid consists of a nucleotide sequence of claims 17
20 or 18.

34. A cell transformed with the expression vector of claims 20, 23, 26, 29 or 32.

35. A substantially purified polypeptide corresponding to human Borna disease virus (BDV) p24 polypeptide comprising
25 an amino acid residue sequence selected from the group consisting of SEQ ID NO 20, SEQ ID NO 21, SEQ ID NO 22, MATGPSSLVDSLEDEEDP (SEQ ID NO 32) and RIYPQLPSAPTADEWDIIP (SEQ ID NO 33).

36. The polypeptide according to claim 35 wherein the polypeptide is a synthetic polypeptide.

37. The polypeptide according to claim 35 wherein the polypeptide is a recombinant polypeptide.

5 38. The polypeptide according to claim 37 wherein the recombinant polypeptide is a fusion protein.

39. A substantially purified polypeptide corresponding to human Borna disease virus (BDV) p16 polypeptide consisting essentially of an amino acid residue sequence selected from
10 the group consisting of SEQ ID NO 23, SEQ ID NO 24, SEQ ID NO 25, MNSKHSYVELKGKVIVPG (SEQ ID NO 34) and RLRNIGVGPLGPDIRSSGP (SEQ ID NO 35).

40. The polypeptide according to claim 39 wherein the polypeptide is a synthetic polypeptide.

15 41. The polypeptide according to claim 39 wherein the polypeptide is a recombinant polypeptide.

42. The polypeptide according to claim 41 wherein the recombinant polypeptide is a fusion protein.

43. A substantially purified polypeptide corresponding
20 to human Borna disease virus (BDV) p56 polypeptide consisting essentially of an amino acid residue sequence selected from the group consisting of SEQ ID NO 26, SEQ ID NO 27, GLSCNTDSTPGLIDLEIR (SEQ ID NO 36), RSKLRRRRRDTQQIEYLV (SEQ ID NO 37) and LISLCVSLPASFARRRRLGRWQE (SEQ ID NO 38).

25 44. The polypeptide according to claim 43 wherein the polypeptide is a synthetic polypeptide.

45. The polypeptide according to claim 43 wherein the polypeptide is a recombinant polypeptide.

46. The polypeptide according to claim 45 wherein the recombinant polypeptide is a fusion protein.

47. A substantially purified polypeptide corresponding to human Borna disease virus (BDV) p40 polypeptide comprising
5 an amino acid residue sequence selected from the group consisting of SEQ ID NO 28, SEQ ID NO 29, SEQ ID NO 30, MPPKRRLVDDADAMEDQD (SEQ ID NO 39), MEDQDDLYEPPASLPKLP (SEQ ID NO 40) and ELSGEISAIMRMIGVTGLN (SEQ ID NO 41).

10 48. The polypeptide according to claim 47 wherein the polypeptide is a synthetic polypeptide.

49. The polypeptide according to claim 47 wherein the polypeptide is a recombinant polypeptide.

50. The polypeptide according to claim 49 wherein the recombinant polypeptide is a fusion protein.

15 51. A substantially purified polypeptide corresponding to human Borna disease virus (BDV) catalytic domain polypeptide of L polymerase protein consisting essentially of an amino acid residue sequence in SEQ ID NO 31.

20 52. The polypeptide according to claim 51 wherein the polypeptide is a synthetic polypeptide.

53. The polypeptide according to claim 51 wherein the polypeptide is a recombinant polypeptide.

54. The polypeptide according to claim 53 wherein the recombinant polypeptide is a fusion protein.

25 55. An anti-human BDV p24 polypeptide antibody comprising antibody molecules that immunoreact with human BDV and a polypeptide of claim 35.

56. An anti-human BDV p16 polypeptide antibody comprising antibody molecules that immunoreact with human BDV and a polypeptide of claim 39.

5 57. An anti-human BDV p56 polypeptide antibody comprising antibody molecules that immunoreact with human BDV and a polypeptide of claim 43.

58. An anti-human BDV p40 polypeptide antibody comprising antibody molecules that immunoreact with human BDV and a polypeptide of claim 47.

10 59. An anti-human BDV catalytic domain polypeptide antibody comprising antibody molecules that immunoreact with human BDV and a polypeptide of claim 51.

60. A method of detecting a BDV nucleic acid in a sample, the method comprising hybridizing the nucleic acid in 15 the sample with a nucleic acid of claims 1, 5, 9, 12 or 16.

61. The method according to claim 60 wherein the sample is a BDV-infectable cell.

62. The method according to claim 61 wherein the cell is a peripheral blood mononuclear cell.

20 63. The method according to claim 60 wherein the sample is isolated from a human.

64. The method according to claim 60 wherein detecting the BDV nucleic acid is for diagnosing BDV infection.

25 65. The method according to claim 64 wherein the infection is in a subject having a neuropsychiatric disorder.

66. A method for detecting a BDV ligand in a sample, the method comprising the steps of:

(a) contacting the sample with a human BDV polypeptide of claims 35, 39, 43, 47 or 51 for a time period

sufficient to allow the polypeptide to immunoreact with the BDV ligand thereby forming an immunoreaction complex; and

(b) detecting the immunoreaction complex.

5 67. The method according to claim 66 wherein the BDV ligand is an antibody.

68. The method according to claim 66 wherein the immunoreaction complex is detected by the addition of a detecting antibody that binds to the immunoreaction complex.

10 69. The method according to claim 66 wherein the immunoreaction complex is detected by the indirect immunofluorescence focus assay.

70. The method according to claim 68 wherein the detecting antibody contains a label.

15 71. The method according to claim 70 wherein the label is selected from the group consisting of enzymes, radioisotopes, fluorescent compounds, colloidal metals, chemiluminescent compounds, phosphorescent compounds and bioluminescent compounds.

20 72. The method according to claim 66 wherein the polypeptide is immobilized on a solid support.

73. The method according to claim 66 wherein the sample comprises a body fluid.

74. The method according to claim 73 wherein the body fluid is serum.

25 75. The method according to claim 66 wherein the sample is isolated from a human.

76. The method according to claim 66 wherein detecting the BDV ligand is for diagnosing BDV infection.

77. The method according to claim 76 wherein the infection is in a subject having a neuropsychiatric disorder.

78. A method for detecting a BDV antigen in a sample, the method comprising the steps of:

5 (a) contacting the sample with an anti-human BDV antibody of claims 55, 56, 57, 58 or 59 for a time period sufficient to allow the antibody to immunoreact with the BDV antigen present in the sample thereby forming an immunoreaction complex; and

10 (b) detecting the immunoreaction complex.

79. The method according to claim 78 wherein the immunoreaction complex of said step (b) is detected by the addition of a detecting antibody.

80. The method according to claim 79 wherein the
15 detecting antibody contains a label.

81. The method according to claim 80 wherein the label is selected from the group consisting of enzymes, radioisotopes, fluorescent compounds, colloidal metals, chemiluminescent compounds, phosphorescent compounds and
20 bioluminescent compounds.

82. The method according to claim 78 wherein the anti-human BDV antibody is immobilized on a solid support.

83. The method according to claim 78 wherein the sample comprises cells.

25 84. The method according to claim 83 wherein the cells are peripheral blood mononuclear cells.

85. The method according to claim 78 wherein the immunoreaction complex of said step (b) is detected by flow cytometry.

86. The method according to claim 78 wherein the immunoreaction complex of said step (b) is detected by ELISA.

87. The method according to claim 78 wherein the immunoreaction complex of said step (b) is detected by immunoblot analysis.

88. A kit for detecting the presence of BDV nucleic acid in a sample, the kit comprising packaging means being compartmentalized to receive in close confinement therein one or more containers comprising separate containers containing a human BDV nucleic acid of claims 1, 5, 9, 12 or 16.

89. A kit for detecting the presence of a BDV antibody in a sample, the kit comprising packaging means being compartmentalized to receive in close confinement therein one or more containers comprising a first container containing a polypeptide of claims 35, 39, 43, 47 or 51.

90. The kit according to claim 89 further comprising a second container containing a detecting antibody.

91. The kit according to claim 90 wherein the detecting antibody contains a label.

92. The kit according to claim 91 wherein the label is selected from the group consisting of enzymes, radioisotopes, fluorescent compounds, colloidal metals, chemiluminescent compounds, phosphorescent compounds and bioluminescent compounds.

93. The kit according to claim 89 wherein the polypeptide is immobilized on a solid support.

94. A kit for detecting a BDV antigen in a sample, the kit comprising packaging means being compartmentalized to receive in close confinement therein one or more containers

comprising a first container containing an anti-human BDV polypeptide antibody of claims 55, 56, 57, 58 or 59.

95. The kit according to claim 94 further comprising a second container containing a detecting antibody.

5 96. The kit according to claim 95 wherein the detecting antibody contains a label.

97. The kit according to claim 96 wherein the label is selected from the group consisting of enzymes, radioisotopes, fluorescent compounds, colloidal metals, chemiluminescent
10 compounds, phosphorescent compounds and bioluminescent compounds.